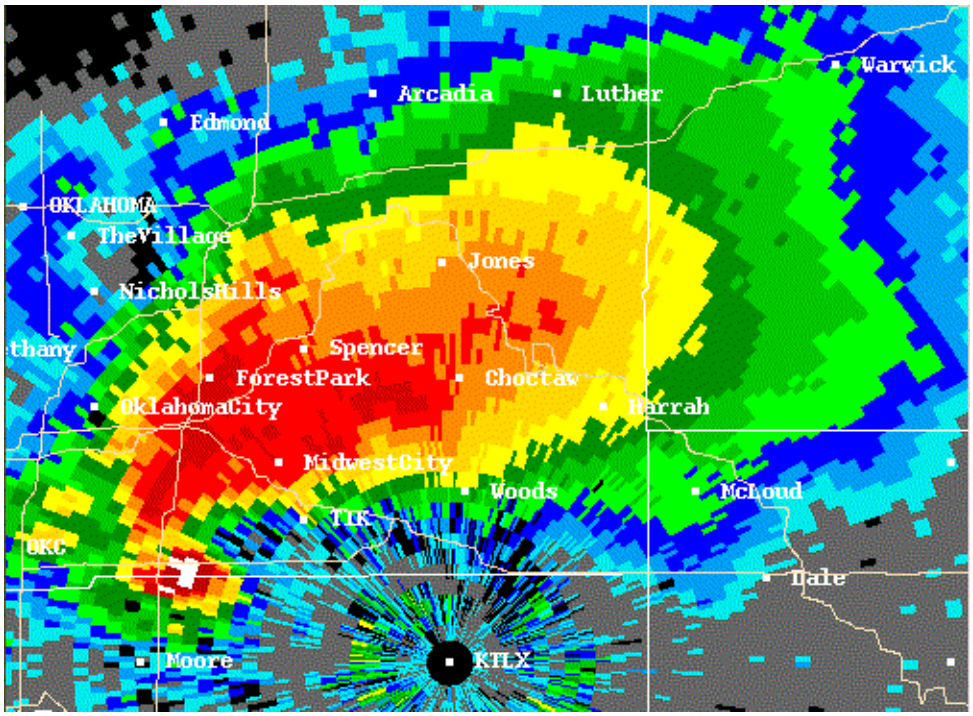
Distance Learning Operations Course



Orientation

Presented by the

Warning Decision Training Branch

Version: 0609

Introduction

Welcome to the Distance Learning Operations Course (DLOC)! This course will significantly contribute to your use of the WSR-88D when making weather decisions, particularly warning decisions. A thorough knowledge of the WSR-88D's products and operational procedures is essential to fully utilize this valuable tool. Skilled interpretation of WSR-88D data is fundamental to making sound forecast and warning decisions.

This document has two purposes. You will use it as a reference while attending the Course Orientation teletraining session. You will also use this document as a resource as you progress through the course.

This Orientation teletraining session will provide you with a thorough outline of course content, as well as an overview of course procedures. For example, you will need to know when and how to take a particular course exam.

It is ***very important*** that your DLOC Facilitator attend your Course Orientation teletraining session with you. This will help everyone to get started knowing what to expect as the course progresses.

Lead Instructor

The first step in the Course Orientation is introducing you to your Lead Instructor. The Lead Instructor will be your point of contact at the Warning Decision Training Branch (WDTB) for the duration of the course. He or she can help you with all aspects of the course. If you have questions about content or course logistics, please contact your Lead Instructor. Also, your Lead Instructor may contact you from time to time to check on your progress or to let you know of any changes.

Lead Instructor: _____

Phone Number: (405) 325 - _____

E-mail Address: _____@noaa.gov

Sometimes, your Lead Instructor may not be immediately available. If you need to contact someone in our branch, please call or e-mail Linda Curtis, our Administrative Assistant.

Linda's phone number: (405) 325 - 3190

Linda's e-mail: Linda.J.Curtis@noaa.gov

Local Training Officer Support

Successful administration of this course is ***highly dependent*** on the support of your local office management, particularly your DLOC Facilitator. Most likely this person will be your SOO, or someone that your SOO has designated. Your DLOC Facilitator will be the office contact person for course administration. For example, the DLOC Facilitator will receive any materials that we mail to the office related to the DLOC and will then distribute them to you as appropriate.

Course Materials

This document should have arrived as part of a larger packet of course materials. The following is an itemized list of the course materials that should now be in your possession.

1. Large 3-ring binder
2. Student Guide for DLOC Orientation
3. Instructions for Topic 1, "Radar Applications Using AWIPS"
4. Instructions for Topic 2, "Introduction to the WSR-88D"

5. Student Guide for Topic 3, “Principles of Meteorological Doppler Radar”
6. Student Guide for Topic 4, “Velocity Interpretation”
7. Student Guide for Topic 5, “Base and Derived Products”
8. Instructions for Topic 6, “System Operations and Control”
9. Student Guide for Topic 7, “Convective Storm Structure and Evolution”
10. Overview for Topic 8, “DLOC Workshop”

If any of these materials are not in your packet, ***first*** check with your DLOC Facilitator to ensure that everything has been distributed. If something is still missing, contact your Lead Instructor or Linda Curtis.

History of the DLOC

Though constantly updated as the WSR-88D evolves, the DLOC is a course that has a long history. From 1990 to 1997, it was known as the WSR-88D Operations Course and was taught in residence in Norman, OK. In 1997, due to budget constraints, the decision was made to teach the course on-station rather than in residence. This involves a combination of delivery methods such as teletraining, self-guided web modules and instructor-guided web modules. Though the course content did not change, the course was retooled to account for the new delivery methods and the first DLOC was delivered in 1998. A residence component (DLOC Workshop) was added in 1999.

Time commitment

When the course was taught entirely in residence, it was nearly four weeks long. Since the goals and objectives of the course have ***not*** changed, the

on-station version, DLOC, requires a ***significant*** time commitment. Scheduling at a WFO is often a challenge, so planning ahead as much as possible is highly recommended.

Job Task Skills and Knowledge

The following are the specific job task skills, knowledge, and abilities that the DLOC addresses. The course objectives, which are presented as you progress through the DLOC, are based on these job task skills and knowledge.

1. Display and manipulate WSR-88D products using the AWIPS workstation.

2. Describe the basic equipment groups (and primary components) of the WSR-88D system and the functions they perform.

3. Describe the processes by which the WSR-88D estimates precipitation and the potential error sources involved.

4. Describe the processes by which Doppler velocity information is obtained by the WSR-88D.

5. Describe the base data generation process.

6. Identify inherent limitations in pulsed Doppler radar and show how operators can mitigate data ambiguities on associated products.

7. Interpret various large and small scale Doppler velocity patterns and their corresponding meteorological conditions.

8. Interpret all Base and Derived products of the WSR-88D including:

a. Specific characteristics of Base and Derived products.

b. Strengths and limitations of Base and Derived products.

c. Specific operational applications of Base and Derived products.

9. Describe basic systems operations, communications aspects, and control of system components of the WSR-88D.

10. Identify the fundamental relationships and physical processes that buoyancy and vertical wind shear have on convective storm structure, type, and evolution.

11. Identify environmental characteristics, conceptual models, and radar signatures associated with the spectrum of convective storms.

12. Identify contributing factors of discrete azimuthal sampling that may distort Mesocyclone and Tornadic Vortex Signatures (TVSs).

13. Identify typical 3-D storm-relative velocity signatures associated with stages of mesocyclone core evolution.

14. Choose the appropriate Volume Coverage Pattern for any given weather situation.

15. Recognize impacts of vertical sampling resolution on algorithm performance.

16. Identify strengths and limitations of using WSR-88D data in winter weather situations.

17. Identify the role of using WSR-88D data in the severe weather warning process especially:

a. the variables which influence the warning decision.

b. aspects of effective decision making.

c. severe weather warning methodologies.

18. Employ effective strategies for optimizing data quality such as using

a. proper settings of Clutter Suppression.

b. proper settings of the PRF.

c. proper settings of adaptable parameters.

DLOC Topics and Exam Schedule

The DLOC is divided up into Topics and some of the Topics are subdivided into Lessons. Each of these elements (Topic or Lesson) will have its own objectives and the delivery methods will vary. It will be very helpful to you to stay familiar with the Topic structure as you progress through the course. It is particularly important that you

1. complete the Topics in the appropriate order.
2. complete each exam as soon as possible after you've finished the Topic or Lesson that the exam covers.
3. complete all the exams before attending the DLOC Workshop, which will serve as a "wrap-up" for the course. ***You will not receive your course certificate at the workshop if you have not completed all of the exams.***
4. arrive at the DLOC Workshop "warning ready". This means that you have sufficient AWIPS experience (displaying products, using WarnGen, etc.) to issue warnings during the workshops scenarios.

Objectives

As you progress through the course, each Topic or Lesson will have written objectives that specify the material that you are expected to know. Reviewing the objectives for test preparation is the most effective way to succeed in the DLOC!

The following is the listing of each DLOC Topic and any Lessons that may comprise that Topic. There is information on the content, delivery method, and expected completion time. You will also find the prerequisite for each Topic or Lesson. This will guide you in completing the material in the proper order.

Exams

You will also find information on the exams, such as the type of exam, content that each exam cov-

ers, as well as a completion schedule. There are two types of exams. The first type is the series of on-line exams for each Topic or Lesson administered through the LMS (http://e-learning.doc.gov/). The second type is the AWIPS Radar Proficiency Exam, which is administered on station by the DLOC facilitator.

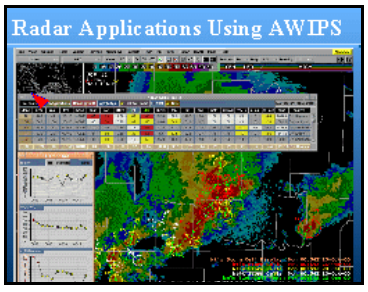
Completion of the DLOC requires a score of at least 70% for each exam taken. The LMS will automatically allow one retake for the on-line exams. For the AWIPS Proficiency Exam, a retake or other remediation tasks will be at the discretion of the DLOC facilitator.

All course exams must be closed book and taken while you are at the office.

DLOC Orientation

The first step in completing the DLOC is attending the DLOC Orientation. This one-hour teletraining session gives you and your Training Officer a chance to meet your lead instructor and prepares you to take the course.

Topic 1 "Radar Applications Using AWIPS"



Delivery Method: Self-guided web module and DLOC Facilitator

Prerequisite: Orientation Teletraining

Expected Completion Time: 22 hours

This set of "job sheets" describes the basic functionality and characteristics of using radar products on the AWIPS workstation.

AWIPS Radar Proficiency Exam

The AWIPS Radar Proficiency Exam covers the objectives from Topic 1. It will be administered by your DLOC Facilitator. You will complete a series

of tasks at the AWIPS workstation to demonstrate proficiency at displaying and manipulating radar data. You are ***strongly encouraged*** to complete the AWIPS Radar Proficiency Exam as early in the course as possible! You ***must*** complete this exam before Topic 8, the DLOC Workshop!

Achieving AWIPS Radar Proficiency is an essential element to being "warning ready" when you arrive at the DLOC workshop. Performing one or more Weather Event Simulator (WES) simulations prior to the workshop would be especially beneficial.

Delivery Method: Self-guided web module

Prerequisite: Orientation Teletraining

Expected Completion Time: 2 hours

An overall system description is provided, covering the equipment groups (RDA, Wideband Communications, RPG, and Users) and their primary subcomponents.

The exam for Topic 2 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

Topic 2 "Introduction to the WSR-88D"

Topic 3 is divided up into 6 different Lessons:

Lesson 1: "WSR-88D Fundamentals"

Topic 3 "Principles of Meteorological Doppler Radar"

Lesson 2: “Signal Processing”

Lesson 3: “Base Data Generation”

Lesson 4: “Clutter Suppression”

Lesson 5: “Mitigation of Data Ambiguities”

Lesson 6: “Precipitation Estimation”

These Lessons have different delivery methods, prerequisites, and completion times. Each Lesson will also have an on-line exam administered through the LMS.

It is very important to proceed through these lessons in order. For example, Lesson 5, “Mitigation of Data Ambiguities”, is a teletraining session. Your understanding of the material presented during the Lesson 5 teletraining is ***dependent*** on your knowledge of the material in Lessons 1-4.

A single comprehensive student guide is provided for the entire Topic.

Topic 3, Lesson 1: “WSR-88D Fundamentals”

Delivery Method: Self-guided web module

Prerequisite: Topic 2

Expected Completion Time: 2 hours

The web module for Lesson 1 is unique among the Topic 3 web modules in that it is self-guided. It is designed as much for future reference as it is for initial learning. The material presented includes fundamentals that apply to all radars such as range folding, with information specific to the

WSR-88D such as the characteristics of each VCP.

The exam for Topic 3, Lesson 1 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

Delivery Method: Instructor-guided web module

Prerequisite: Topic 3 Lesson 1

Expected Completion Time: 1 hour

This instructor-guided web module uses a streaming video format with audio. This module presents the fundamentals of WSR-88D Pulse-Pair Processing and is particularly important for the Lesson 5 teletraining, “Mitigation of Data Ambiguities”.

The exam for Topic 3, Lesson 2 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

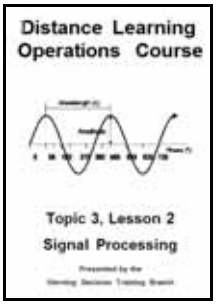
Delivery Method: Instructor-guided web module

Prerequisite: Topic 3 Lesson 2

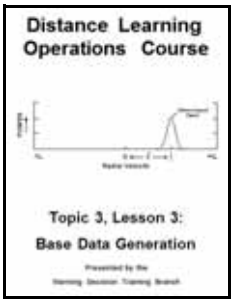
Expected Completion Time: 30 minutes

This instructor-guided web module uses a streaming video format with audio. This module presents an overview of the Base Data generation process, with an emphasis on Spectrum Width.

Topic 3, Lesson 2: “Signal Processing”

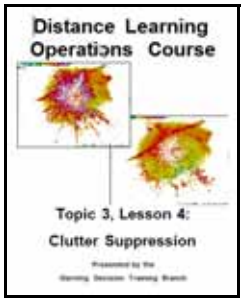


Topic 3, Lesson 3: “Base Data Generation”



The exam for Topic 3, Lesson 3 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

Topic 3, Lesson 4: "Clutter Suppression"



Delivery Method: Instructor-guided web module

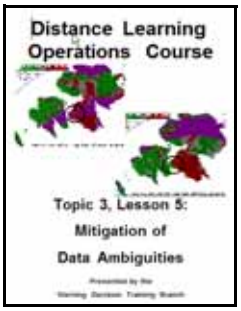
Prerequisite: Topic 3 Lesson 3

Expected Completion Time: 1 hour

This instructor-guided web module uses a streaming video format with audio. This module presents the WSR-88D technique for clutter suppression, as well as procedures that operators must use to appropriately apply clutter suppression.

The exam for Topic 3, Lesson 4 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

Topic 3, Lesson 5: "Mitigation of Data Ambiguities"



Delivery Method: Teletraining

Prerequisite: Topic 3 Lesson 4

Expected Completion Time: 3 hours

This teletraining session will present the range and velocity folding mitigation techniques for the WSR-88D. ***Your understanding of this material is dependent on completion of Lesson 1-4 before attending the teletraining.***

The exam for Topic 3, Lesson 5 will be administered on-line through the LMS. It is closed book

and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

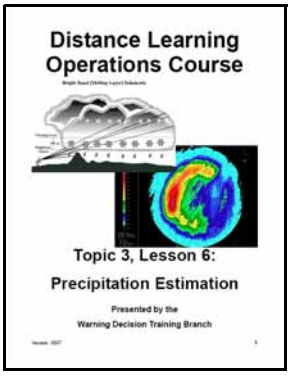
Delivery Method: Instructor-guided web module

Prerequisite: Topic 3 Lesson 5

Expected Completion Time: 1 hour

This instructor-guided web module uses a streaming video format with audio. The module presents how the WSR-88D estimates reflectivity and rainfall rates, potential error sources associated with radar rainfall estimates, the comparison of radar rainfall estimates to rain gage data. The lesson then presents the rainfall algorithm known as the Precipitation Processing System (PPS) and the snowfall algorithm known as the Snow Accumulaiton Algorithm (SAA).

Topic 3, Lesson 6: "Precipitation Estimation"

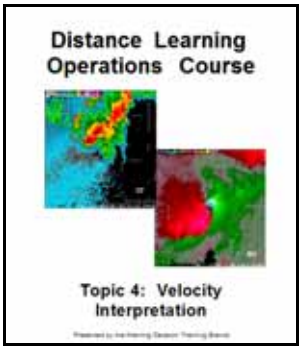


The exam for Topic 3, Lesson 6 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

You are ***strongly encouraged*** to complete all Topic 3 exams before moving on to Topic 4! You ***must*** complete all the exams before Topic 8, the DLOC Workshop!

Topic 3 Exams

Topic 4 "Velocity Interpretation"



Delivery Method: Instructor-guided web module

Prerequisite: Topic 3

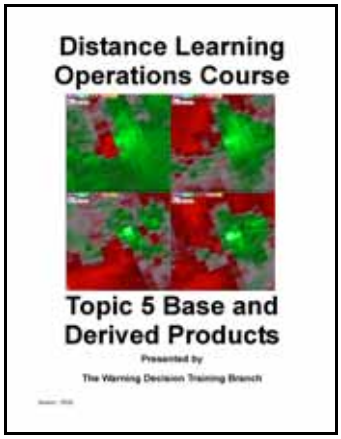
Expected Completion Time: 1 hour, 30 minutes

This instructor-guided web module uses a streaming video format with audio. It will describe the methods of interpreting large and small scale velocity patterns, and horizontal discontinuities (e.g.fronts).

The exam for Topic 4 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

You are ***strongly encouraged*** to complete this exam before moving on to Topic 5! You ***must*** complete this exam before Topic 8, the DLOC Workshop!

Topic 5 "Base and Derived Products"



Delivery Method: Teletraining

Prerequisite: Topic 4

Expected Completion Time: 10 hours

This module will present the suite of Base and Derived Products and their applications. Also presented will be relevant information on the algorithms that generate the various products and displays. This Topic is taught in three 3-hour teletraining sessions on three consecutive days.

The exam for Topic 5 will be administered on-line through the LMS. It is closed book and must be

taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

You are ***strongly encouraged*** to complete this exam before moving on to Topic 6! You ***must*** complete this exam before Topic 8, the DLOC Workshop!

Delivery Method: Self-guided web module

Prerequisite: Topic 5

Expected Completion Time: 6 hours

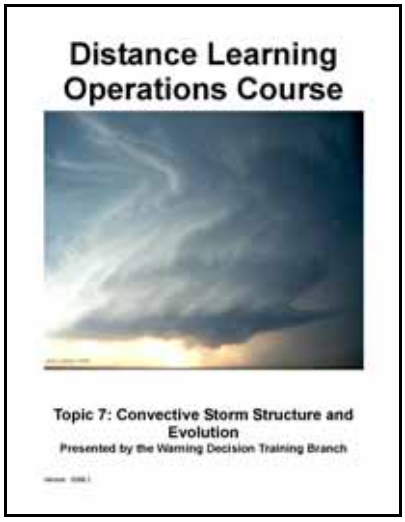
This module provides an understanding of overall WSR-88D operations and basic familiarization with the Master System Control Function (MSCF) and the Radar Product Generator (RPG) Human Computer Interface (HCI).

The exam for Topic 6 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

You are ***strongly encouraged*** to complete this exam before moving on to Topic 7! You ***must*** complete this exam before Topic 8, the DLOC Workshop!

Topic 6 “System Operations and Control”

Topic 7 “Convective Storm Structure and Evolution”



Delivery Method: Teletraining

Prerequisites:

- Topic 5
- RTM-230 "Skew T log P Diagram and Sounding Analysis"
- "Capabilities of Kinematic and Thermodynamic Severe Weather Parameters"

Expected Completion Time: 10 hours

Topic 7 describes some important thermodynamic and kinematic parameters developed to evaluate convective severe weather potential. The instruction also treats the fundamental relationships between shear and instability with respect to convective storm type, focusing both on recent observations and numerical simulations of storms. Next are typical environments of weakly sheared and strongly sheared convection, recognition and interpretation of severe storm signatures, and how severe weather signatures are manifested by particular severe weather hazards.

The exam for Topic 7 will be administered on-line through the LMS. It is closed book and must be taken while you are at the office. You must achieve a score of at least 70% to pass. You will be allowed one retake.

You ***must*** complete the Topic 7 exam before attending Topic 8, the DLOC Workshop!

Topic 8 “DLOC Workshop”

Delivery Method: Residence Workshop at the WDTB in Norman, OK

Prerequisites:

- Successful completion of ***all*** course exams - ***You will not receive your course certificate at the workshop if you have not completed all of the exams.***
- Arrival at the workshop “warning ready” - In addition to successful completion of the AWIPS Proficiency Exam, performing one or more WES simulations to gain some familiarity with WarnGen prior to the workshop is ***highly recommended***.

Expected Completion Time: 28 hours

This workshop is the culmination of the DLOC. It is offered as an opportunity to apply the instructional topics from the Course. In addition to instruction provided in a traditional classroom setting, the workshop utilizes a state of the art laboratory where students will experience multiple simulated operational warning events using the WES. Topics of instruction include:

- office warning strategies
- threat assessment
- storm interrogation
- flash flooding
- hail production and detection
- satellite integration
- warning decision making
- future evolution of the WSR-88D and AWIPS

Sources of Information

As you progress through the course, you will need a resource for course information, accessing web modules, registering for teletraining, etc. The DLOC home page is the one stop shop for DLOC materials and information. The URL is:

http://wdtb.noaa.gov/courses/DLOC/index.html

This page will provide you with links to everything that you will need. Examples include the DLOC description and registration pages.

Teletraining Registration

For each Topic or Lesson that is delivered using teletraining, you can choose to attend one of several sections that will be available. You may choose the section that best fits your work schedule. However, enrollment is conducted on a first-come, first-served basis, so early enrollers are most likely to get the sections they want!

Enrollment Coordination

It is important that you ***do not register for a particular section until you have coordinated your schedule with local office management***. If there is more than one person from your office enrolled in the DLOC, we encourage you to register for the same teletraining sessions. Attending together will enhance your learning experience, as you can often learn from one another.

Coordination is important for another reason. The facility used for your session (often the office conference room) must be available at the date and time of your session.

Course Planning

You have significant flexibility with respect to attending the various teletraining sessions. ***Since you choose which teletraining section to attend, the amount of time between sessions is up to you.*** If you wish to complete the teletraining

in a compressed format, there is enough overlap from one IC to the next to allow you to do so. In fact, it would be possible to attend all of the teletraining within a few weeks, though this would also result in the need to complete one exam a week!

The DLOC planning schedule can be accessed from the DLOC Home Page, and can be used to plan your teletraining attendance.

Teletraining Overview

Teletraining Technology

Teletraining will be conducted using the VISITview software, which is Internet based. Should an Internet outage occur, VISITview has a local mode, which allows each site to advance the presentation slides on their own. We will use this as a backup mode if necessary, so it is important to be familiar with loading the VISIT local mode for each session that you attend.

Audio

We will use a conference call for audio. This will result in better audio quality than could be attained over the Internet. It will also allow the audio connection to remain in place should any interruptions in the data flow occur over the Internet.

The DLOC audio conference phone number is

866-564-5812

The passcode is 2094167

Preparing for a Teletraining Session

Prior to your session, the VISITview files must be downloaded and installed on the PC that will be used for your session. This should be done by your DLOC Facilitator or his or her designate. An

executable file will be posted on the WDTB website. Once the file is downloaded, stored and extracted on your office teletraining PC, the presentation and all the necessary VISITview software is stored and ready for your session.

Teletraining Protocol

As a general rule, the instructor does the logistical work and you get to relax and learn. Your instructor will control the slides that are displayed, and will perform most of the annotations. Interaction within the group is very important to the process, and your instructor will do a variety of things to include members of the class. From time to time, students will be called upon to answer questions or draw something on the display. This may be done both individually or in groups.

Student guides

Bring your student guide with you to be used during you teletraining session. The guide will follow the presentation closely, allowing you to take notes and to organize your thoughts. Another tremendous advantage in comprehending the material is to review the guide before your session.

Muting the phones

We will ask that you keep the microphone on your speakerphone muted during the presentation, except when the instructor calls on you. Though we like to hear from everyone, background noise is inevitable when the microphones are left on during the presentation, and it can sometimes be distracting.

It is very important that local office management understands that you are in a training session and that you should not be interrupted except for rare events. Do whatever you can to secure a quiet area for your session. For example, keep the door closed and/or hang a big “Do Not Disturb” sign somewhere for all to see!

DLOC Checklist

You may use the following checklist as you progress through the DLOC to ensure that you have completed all the necessary elements. We encourage you to coordinate due dates with your DLOC Facilitator to better track your progress.

Table Orientation-1: DLOC Elements for Completion

Topics/Lessons/Exams	Expected Completion Data	Actual Completion Date
Orientation		
Topic 1: “Radar Applications Using AWIPS”		
AWIPS Proficiency Exam		
Topic 2: “Introduction to the WSR-88D”		
Topic 2 Exam		
Topic 3, Lesson 1: “WSR-88D Fundamentals”		
Topic 3, Lesson 1 Exam		
Topic 3, Lesson 2: “Signal Processing”		
Topic 3, Lesson 2 Exam		
Topic 3, Lesson 3: ”Base Data Generation”		
Topic 3, Lesson 3 Exam		
Topic 3, Lesson 4: “Clutter Suppression”		
Topic 3, Lesson 4 Exam		
Topic 3, Lesson 5: “Mitigation of Data Ambiguities”		
Topic 3, Lesson 5 Exam		
Topic 3, Lesson 6: “Precipitation Estimation”		
Topic 3, Lesson 6 Exam		
Topic 4: “Velocity Interpretation”		
Topic 4 Exam		
Topic 5: “Base and Derived Products”		
Topic 5 Exam		
Topic 6: “System Operations and Control”		
Topic 6 Exam		
Topic 7: “Convective Storm Structure and Evolution”		
Topic 7 Exam		
Topic 8: DLOC Workshop		

Questions??????